ON THE WING

A.W.52 Air Tests Commence : Control Systems

Illustrated by "Flight" Photographs and Sketches

THE purpose and principal characteristics of the A.W.52 and its forerunner the 52 glider are now familiar to most people, but the occasion of the presentation of the first aerial photographs of this outstanding, nationally and internationally important, aircraft seems to call for a statement of the present position and of progress made to date. It should be noted, in passing, that the fact that S/L. Franklin was prepared to fly this unconventional prototype in close proximity to another aircraft—a Lincoln carrying our photographer—is significant in itself. Since its first flight from Boscombe Down on November 13th, weather conditions have been such that only three or four flights have been possible. It is seldom that sufficient confidence is felt in even a conventional prototype for it to be flown in formation within five hours of the first take-off.

As has been stated previously, unexpected hydraulic troubles held up the flight of the A.W.52 for about twelve months. It may be as well, therefore, to refresh memories of some of the details of the control systems, which were described, together with the construction and other features, in *Flight* of December 19th, 1946, at the time when the aircraft was being completed. It will be remembered that the first public demonstration of the A.W.52 was given one year later, on December 16th last, and some notes on this, and the part the aircraft is playing in the country's research programme, were contained in our Christmas Day issue.

If the ultimate aim of minimum drag is to be achieved by resorting to all-wing designs, i.e., by discarding the fuselage and tail surfaces and burying the engines, a great deal more must be learned about stability and control of tailless aircraft. This is, of course, the purpose of the A.W.52 research machine. That which has already been learned from the A.W.52G, and from models in the wind tunnel since early 1943, when the design was commenced, is illustrated by the performance of this first unpowered Armstrong-Whitworth tailless machine, and also by the encouraging initial impression given by the Nene-engined A.W.52 itself.

So far, the maximum lift coefficient achieved with a tailless aircraft has been appreciably lower than with a conventional layout; on the 52 a figure of 1.6, flaps-down, has been achieved. This inherent disadvantage, the subject of considerable investigation, is one of the most important problems in connection with tailless aircraft. One of the reasons for the low maximum lift coefficient is the nearness of the controllers (combined elevator and aileron surfaces) to the centre of gravity and the resulting increase in down load on their surfaces